(ii) one or more specific chemically-modified primers each of which primer is substantially complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a nucleic acid producing catalyst;

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength to produce at least one copy of said specific nucleic acid; and

(d) removing all primer sequences from the product produced in step (c) to regenerate a primer binding site, thereby allowing a new priming event to occur and producing more than one copy of said specific nucleic acid.

92. (NEW) The process of claim 91, wherein said removing step (d) is carried out by digestion with an enzyme.

93. (NEW) The process of claim 92, wherein said enzyme comprises ribonuclease H.

94. (NEW) The process of claim 91, wherein said specific chemically modified primers comprise ribonucleic acid, deoxyribonucleic acid, a DNA.RNA copolymer, a polymer capable of hybridizing or forming a base-specific pairing complex and initiating nucleic acid polymerization, or a combination of any of the foregoing.

95. (NEW) The process of claim 91, wherein said specific chemically modified primers comprise a 3'-hydroxyl group or an isosteric configuration of heteroatoms.

96. (NEW) The process of claim 95, wherein said heteroatoms comprise nitrogen or sulfur.

97. (NEW) The process of claim 91, wherein said specific chemically modified primers comprise nucleoside triphosphates, nucleoside triphosphate analogs, or a combination thereof, wherein at least one of said nucleoside triphosphates or analogs is modified on the sugar, phosphate or base.

98. (NEW) The process of claim 91, wherein said specific chemically modified primers further comprise from about 1 to about 200 noncomplementary nucleotide or nucleotide analogs.

99. (NEW) An *in vitro* process for producing more than one copy of a specific nucleic acid, said products being free of any primer sequences, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) unmodified nucleic acid precursors,

(ii) one or more specific unmodified primers each of which primer comprises at lease one non-complementary sequence to a distinct sequence of said specific nucleic acid, such that upon hybridization to said specific nucleic acid at least one loop structure is formed, and

(iii) an effective amount of a nucleic acid producing catalyst;

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing primer sequences from the product produced in step (c) to regenerate a primer binding site, to allow a new priming event to occur and produce more than one copy of said specific nucleic acid.

100. (NEW) The process of claim 99, wherein said removing step (d) is carried out by digestion with an enzyme.

101. (NEW) The process of claim 100, wherein said enzyme comprises ribonuclease H.

102. (NEW) The process of claim 99, wherein said specific unmodified primers comprise ribonucleic acid, deoxyribonucleic acid, a DNA.RNA copolymer, a polymer capable of hybridizing or forming a base-specific pairing complex and initiating nucleic acid polymerization, or a combination of any of the foregoing.

103. (NEW) The process of claim 99, wherein said specific unmodified primers further comprise from about I to about 200 noncomplementary nucleotide or nucleotide analogs.

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